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The activity of *Pleurotus ostreatus* extracts against pathogenic fusaria.

Matias Pasquali, Alessio Scarafoni, Elena Maria Colombo, Chiara Muratore, Francesca Gallotti, Vera Lavelli
University of Milan, Milan, Italy

Abstract

A *P. ostreatus* strain, appreciated as food and for the production of nutraceuticals, was grown on a commercial substrate, dried at low temperature (<40°C) and grinded in order to produce a mushroom powder. The bioactivity of the water extract conserved at 4°C in the dark was then assessed on *F. graminearum*, *F. culmorum* and *F. musae* at different time points from production (4 hrs, 40 days, 4 months). Moreover, the effect of the extracts on trichothecene type B production was measured exploiting a *F. graminearum* isolate expressing GFP-tagged trichodiene synthase. This allowed to monitor the first step of toxin production using a microplate fluorimeter.

While mycelial growth of *F. graminearum and F. culmorum* was completely blocked at 3 mg/ml, mycelial growth of *F. musae* was inhibited at 90%. MIC50 was measured for *F. graminearum* and *F. culmorum* at 300 micrograms/mL. A loss of the bioactivity of *P. ostreaus* water extract on fungal growth was observed at 40 days (-30%) and of a further -30% at 4 months. A preliminary study on the biological activities of the extract identified a strong protease activity associated to low molecular weight proteins. Their bioactivity decreased over storage time in accordance with a decreased proteolytic activity.

The *P. ostreatus* extract modulates trichothecene production independently from the protease activity, even at concentration where no mycelium inhibition was observed (down to 0.75 micrograms/mL).

Studies on the genetic determinants of the protease activity as well as the compounds able to modulate trichothecene production are ongoing.